
Wisoff JH, Boyett JM, Berger MS, Brant C, Li H, Yates AJ, McGuire-Cullen P, Turski PA, Sutton LN, Allen JC, Packer RJ, Finlay JL.
Division of Pediatric Neurosurgery, New York University Medical Center, New York, USA.

Object
One hundred seventy-two children with high-grade astrocytomas were treated by members of the Children's Cancer Group in a prospective randomized trial designed to evaluate the role of two chemotherapy regimens. Seventy-six percent of the patients (131 children) in whom a diagnosis of either anaplastic astrocytoma or glioblastoma multiforme was confirmed by central pathological review are the subject of this report.

Methods
Patients were stratified according to the extent of tumor resection (biopsy [< 10%], partial resection [10-50%], subtotal resection [51-90%], near-total resection [> 90%], and total resection) as determined by surgical observation and postoperative computerized tomography scanning. Information on contemporary neurosurgical management was obtained from the patient's operative records and standardized neurosurgical report forms. The vast majority of tumors were supratentorial: 63% (83 tumors) in the superficial cerebral hemisphere, 28% (37 tumors) in the deep or midline cerebrum, and only 8% (11 tumors) in the posterior fossa. A significant association was detected between the primary tumor site and the extent of resection (p < 0.0001). A radical resection (> 90%) was performed in 37% of the children: 49% of the tumors in the superficial hemisphere and 45% of tumors in the posterior fossa compared with 8% of midline tumors. Tumor location could also be used to predict the need for both temporary and permanent cerebrospinal fluid (CSF) diversion. Half of the deep tumors and 8% of the hemispheric astrocytomas ultimately required a permanent CSF shunt. Improvement in preoperative neurological deficits and level of consciousness was seen in 36% and 34% of the children, respectively. New or increased deficits were present in 14% of the children, with 6% experiencing a diminished sensorium after surgery. Postoperative nonneurological complications were rare: infection, hematoma, and CSF fistula each occurred in 1.7% of the children. Univariate and multivariate analyses demonstrated that radical tumor resection (> 90%) was the only therapeutic variable that significantly improved progression-free survival (PFS) rates. For all patients with malignant astrocytomas, the distributions of PFS rates were significantly different (p = 0.006) following radical resection compared with less extensive (< or = 90%) resection. The 5-year PFS rates were 35 +/- 7% and 17 +/- 4%, respectively. The differences in the distribution of PFS rate were significant for the subsets of patients with anaplastic astrocytoma (p = 0.055) and glioblastoma multiforme (p = 0.046). The 5-year PFS rates for anaplastic astrocytoma were 44 +/- 11% and 22 +/- 6% for cases in which the tumor was radically resected and less than radically resected, respectively; whereas the 5-year PFS rates for glioblastoma multiforme were 26 +/- 9% and 4 +/- 3% for cases in which the tumor was radically resected and less than radically resected, respectively.
CONCLUSIONS: The demonstration of a survival advantage provided by radical resection should prompt neurosurgeons to treat malignant pediatric astrocytomas with aggressive surgical resection prior to initiation of radiotherapy or adjuvant chemotherapy.

Comment in

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